SeedSCOOP

ALFALFA SUMMER AND FALL MANAGEMENT PRACTICES

Key Points

- A late summer alfalfa cutting should occur early enough so plants can regrow, produce, and store carbohydrates before entering fall dormancy, thus increasing winter survivability.
- Accurate stand evaluation is critical for estimating yield potential and deciding whether to keep an alfalfa stand.
- Providing an adequate supply of nutrients, especially potassium and sulfur are important to maintain high yield potential.

Late Summer and Fall Alfalfa Harvests

Alfalfa (*Medicago sativa*) stands need a break from harvest during the six to eight weeks prior to the first killing frost. In northern areas, this timeframe is roughly the beginning of September through mid-October and later in more southern regions.[1] Having this rest period allows plants to build up adequate reserves of carbohydrates (CHO) in the roots before winter begins. This process can help plants survive winter temperatures and use the stored CHO to regrow in the spring. If plants are cut during this rest period, the speed of spring regrowth the next season may be reduced, plant stands may thin, and yield potential may be lower. Research has shown that a late fall cutting can be made as long as less than 200 growing degree days (41°F is the standard temperature base) of accumulation remain after the cutting. This GDD benchmark generally prevents significant regrowth and depletion of stored CHOs in the roots going into the winter, which improves winter survivability.[1] Farmers may be tempted to harvest alfalfa during the rest period if significant growth has occurred, but doing this would initiate regrowth and reduce CHO root reserves during a critical time. The risk of stand damage is somewhat reduced under the following conditions: in areas with less severe winters,[1] if the stand is in bloom at the time of the fall cutting, if it has been at least 45 days since the last harvest, and if the stand is old and will be rotated to another crop in the spring. Fields that are high risk if harvested without a rest period include those that are less than a year old in production, stressed with inadequate fertility, and where the alfalfa product does not carry multi-pest resistance.[3] Waiting and making a final cutting after the first hard freeze (24°F or lower) may not hurt alfalfa and may help reduce pest problems.[2]

Evaluating Established Stands

Fall is the best time to evaluate established alfalfa stands for future productivity and decide whether it will be better to keep or rotate out of a stand. In established stands (four to six inches tall), stem counts provide a more accurate estimate of yield potential than counting plants (Figure 1). Older stands tend to have fewer plants but more stems per plant. To estimate the yield potential of the stand, begin by counting the stems within an area (either 17x17 inches or a 2 square feet frame) at four to five random field locations. Take the average of the counts and divide this number by two to determine the average stems per square foot. If the count is more than 55, stem density has 100% yield potential; whereas 40 stems have about a 72% yield potential and replacement should be considered.

Figure 1. Alfalfa stem count method.

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Nutrients and Soil pH

Each ton of alfalfa dry matter removes about 10 pounds of phosphate (P_2O_5), 60 pounds of potash (K_2O), 30 pounds of calcium, 4.6 pounds of magnesium, and 8 pounds of sulfur.[3] A current soil test should be used to determine existing soil pH and nutrient levels, especially phosphorus (P), and potassium (K), to avoid over or under fertilizing in the future. Soil tests are the most reliable method to prevent future nutrient deficiencies, which can decrease alfalfa yield potential and quality. However, a tissue test is the most accurate method to assess sulfur availability. The recommended soil pH level is between 6.8 and 7.0 and alfalfa responds well to fertilization with P and K. Split applications of P and K, based on yield goals, are recommended after the first cutting and again in late summer. If all fertilizer is applied as one annual application, the task should be completed in early fall which may help minimize the potential for winter injury.

Autotoxicity

Limited seedling establishment can occur when seeding into existing stands or into a field where alfalfa was recently removed. Autotoxicity is a problem in alfalfa stands that are two or more years old. However, reseeding into an existing stand is generally successful if the stand is less than one year old and soil pH and fertility in those areas is optimum. In situations where alfalfa stands are thin but it is not practical to destroy the stand, consider interseeding grasses or clover to meet forage needs.

Weed Management

Conventional alfalfa products have limited weed control options, which can hinder stand establishment and persistence resulting in lower yield potential (Figure 2). A Roundup Ready® Alfalfa system gives alfalfa producers the advantage of broad-spectrum weed control and application flexibility with Roundup® brand glyphosate-only agricultural herbicides and may reduce potential crop injury or future rotational concerns. Based on the weeds present, one or more herbicides with different effective sites of action should be used at least once during the middle years of the stand to help reduce the potential for selecting herbicide resistant weed populations.

Figure 2. Regrowth of Roundup Ready® Alfalfa after a postemergence application of a Roundup® brand glyphosate only agricultural herbicide (left) compared to conventional alfalfa after a postemergence application of a con-ventional herbicide (right).

Summary

- Winter survivability may be improved if the last cutting is completed by late summer, which allows time for adequate root reserves to be replenished, or completed in late fall after a hard freeze.
- Carbohydrates stored in the roots and crowns provide energy for regrowth after harvest and may improve winter hardiness to survive winter temperatures.
- Providing an adequate supply of nutrients, especially potassium, is important to maintain high yield potential.
- Alfalfa following alfalfa rotations are usually unsuccessful due to autotoxicity. Reseeding thin stands is only somewhat successful during the initial year of establishment and with adequate soil pH, fertility, and minimal disease or pest pressure.
- Grow an alternative crop for a minimum of one year to negate autotoxicity before reseeding to alfalfa.
- Planting a Roundup Ready® Alfalfa product can help increase establishment, forage quality, and yield potential by offering more weed control options compared to planting conventional alfalfa products.
- Also, consider planting HarvXtra® Alfalfa with Roundup Ready® Technology. It is a biotechnology-derived trait

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- that provides reduced amounts of indigestible lignin at harvest when compared to conventional products of the same harvest age. The new trait provides a wider cutting window which gives farmers greater harvest flexibility and essentially eases the yield versus quality trade-off faced by alfalfa producers. Also, fewer cuttings may be made throughout the year while maintaining quality and overall yield potential. This allows the final cutting to be made earlier which improves CHO storage in the roots, increasing the potential for winter survivability.

Sources

[1] Undersander, D., Cosgrove, D., Cullen, E., Grau, C., Rice, M.E., Renz, M., Shaeffer, C., Shewmaker, G., and Sulc, M. 2011. Alfalfa Management Guide. https://www.agronomy.org/files/publications/alfalfa-management-guide.pdf.

[2] Barnhart, S. 2008. Fall management of alfalfa. Iowa State University. https://crops.extension.iastate.edu/cropnews/2008/09/fall-management-alfalfa.

[3] Shapiro, C. and Anderson, B. Soil management to optimize alfalfa production. University of Nebraska-Lincoln. https://cropwatch.unl.edu/forages/soils/.

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